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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Motoyasu Nagano

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VALLEY FORGE, PA 19482

EXAMINER

DANG, KET D

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,909	Applicant(s) NAGANO ET AL.	
	Examiner KET D. DANG	Art Unit 3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 11, 2011 has been entered.

This office action is responsive to the continued examination filed on July 11, 2011. As directed by the amendment: claims 1-8 have been amended, no claims have been cancelled and no new claims have been added. Thus, claims 1-8 are presently pending in this application.

Response to Amendment/Argument

2. Applicant's amendments/arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, recites the limitation "the arc resistance signal" at line 23 in the claim. There is insufficient antecedent basis for this limitation in the claim. It is unclear and indefinite to the relationship between "the arc resistance signal" and "a resistance signal" at line 22 and to whether they are the same or different. Further clarification is required to either further differentiate (the arc resistance signal) or provide proper antecedent basis.

Claim 2 recites the limitation "a short-circuit waveform control signal" at line 4 renders the claim indefinite. It is unclear for whether this short-circuit waveform control signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested. Furthermore, the limitation "a selected signal" at line 9 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim 3 recites the limitation "an arc waveform control signal" at line 4 renders the claim indefinite. It is unclear for whether this arc waveform control signal is the same as the one recited in the preceding claim. If it is so, then "an" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between

the two are suggested. Furthermore, the limitation "a selected signal" at line 9 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim 4 recites the limitation "a short-circuit waveform control signal" at line 4 renders the claim indefinite. It is unclear for whether this short-circuit waveform control signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested. The limitation "an arc waveform control signal" at line 7 renders the claim indefinite. It is unclear for whether this arc waveform control signal is the same as the one recited in the preceding claim. If it is so, then "an" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested. Furthermore, the limitation "a selected signal" at line 12 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim 5 recites the limitation "a selected signal" at line 36 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited at line 18. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim 6 recites the limitation "a short-circuit waveform control signal" at line 4 renders the claim indefinite. It is unclear for whether this short-circuit waveform control signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested. Furthermore, the limitation "a selected signal" at line 9 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim 7 recites the limitation "an arc waveform control signal" at line 4 renders the claim indefinite. It is unclear for whether this arc waveform control signal is the same as the one recited in the preceding claim. If it is so, then "an" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested. Furthermore, the limitation "a selected signal" at line 9 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim 9 recites the limitation "a short-circuit waveform control signal" at line 4 renders the claim indefinite. It is unclear for whether this short-circuit waveform control signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative

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relationships between the two are suggested. The limitation "an arc waveform control signal" at line 7 renders the claim indefinite. It is unclear for whether this arc waveform control signal is the same as the one recited in the preceding claim. If it is so, then "an" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested. Furthermore, the limitation "a selected signal" at line 12 renders the claim indefinite. It is unclear for whether this selected signal is the same as the one recited in the preceding claim. If it is so, then "a" should be replaced with "the" or "said". If it is not, then essential structural cooperative relationships between the two are suggested.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto (JP 410109163 A) in view of Blankenship (US 6,248,976 B1), Churchward (US 1,687,492), and Needham (US 4518844).

Regarding claims 1 and 5, Kawamoto discloses a consumable electrode type arc welding machine which makes use of an arc generated between a base metal of welding and a wire supplied thereto (para. 0002-0003), the machine comprising: a welding voltage detection circuit for detecting a welding voltage and outputting a

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welding voltage detection signal (Paragraph 3, lines 4-5); a welding current detection circuit for detecting a welding current and outputting a welding current detection signal (Paragraph 3, lines 7-9); a short-circuit arc judgment circuit for outputting a short-circuit arc judgment signal, after accepting the welding voltage detection signal and judging whether the machine is in a short-circuit state or in a arc state (Paragraph 3, lines 5-7); a short-circuit waveform control circuit for outputting a short-circuit waveform control signal after accepting the welding current detection signal (Paragraph 3, lines 9-10); an arc waveform control circuit for outputting an arc waveform control signal for an arc period after accepting the welding voltage detection signal (Paragraph 3, lines 10-12); and a first switching circuit 11 (Fig.1) which accepts the short-circuit waveform control signal and the arc waveform control signal and selects the arc waveform control signal in the arc period or the short-circuit waveform control signal in the short-circuit period based on the short-circuit arc judgment signal, and outputs a selected signal (Paragraph 6, lines 15-17); wherein a welding power 5 (Fig. 1) is controlled by the output from the first switching circuit 11 (Fig. 1), a constant-current control period setting unit outputting a constant-current control period signal which indicates a constant-current control period (Paragraph 6, lines 7-8), a constant-current circuit for outputting a constant-current signal for implementing a certain specific constant-current value after accepting the welding current detection signal and based on the inputted welding current detection signal (Paragraph 6, lines 8-13); and a second switching circuit for selecting 3 (Fig.1) , in accordance with the constant-current control period signal, one of the constant-current signal in the constant-current control period (Paragraph 6, lines 19-20) and the

output signal from the first switching circuit 11 (Fig. 1) in a period other than the constant-current control period, and outputting a selected signal (Paragraph 6, lines 17-19); and the welding power 5 (Fig. 1) is controlled based on the output from the second switching circuit 3 (Fig.1); and wherein when the short-circuit arc judgment circuit judges the machine is in the arc state, the arc waveform control circuit controls the welding current to be held at a constant level when the resistance signal exceeds a second resistance threshold, the constant level current being greater than a normal welding current generated based on the welding voltage (para. 0002-0003).

Kawamoto discloses all of the limitations of the claimed invention as set forth above, except for an resistance calculator for calculating a resistance signal based on the welding voltage detection signal and the welding current detection signal, and the arc resistance signal is delivered to at least one of the short-circuit waveform control circuit and the arc waveform control circuit for controlling the welding power; when the arc resistance signal continues exhibiting a value that is greater than a certain specific value; and when the short-circuit arc judgment circuit judges the machine is in the short-circuit state, the short-circuit waveform control circuit controls the welding voltage to decrease when the resistance signal exceeds a first resistance threshold, controls the welding voltage to increase and the short-circuit period to decrease when the arc resistance signal is below the first resistance threshold.

However, an resistance calculator for calculating a resistance signal based on the welding voltage detection signal and the welding current detection signal, and the arc resistance signal is delivered to at least one of the short-circuit waveform control

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circuit and the arc waveform control circuit for controlling the welding power is known in the art. Blankenship, for example, teaches an resistance calculator for calculating and outputting an resistance signal, and the arc resistance signal is delivered to at least one of the short-circuit waveform control circuit and the arc waveform control circuit for controlling the welding power (col. 2, lines 6-38). Blankenship further teaches such a configuration provides a means the arc length can be maintained during the welding process (col. 2, line 20-23).

Similarly, when the resistance signal continues exhibiting a value that is greater than a certain specific value is known in the art. Churchward, for example, also teaches when the resistance signal continues exhibiting a value that is greater than a certain specific value (page 1, lines 79-81). Churchward also teaches the welding current to be held at a constant level when the resistance signal exceeds a second resistance threshold, the constant level current being greater than a normal welding current generated based on the welding voltage (page 1, lines 67 - page 2, lines 35). Churchward further teaches such a configuration provides a means to overcome such increase in resistance and necessary to supply a greater voltage to the work to maintain a constant flow of current across the arc (page 1, lines 81-85).

Furthermore, when the short-circuit arc judgment circuit judges the machine is in the short- circuit state, the short-circuit waveform control circuit controls the welding voltage to decrease when the resistance signal exceeds a first resistance threshold, controls the welding voltage to increase and the short-circuit period to decrease when the arc resistance signal is below the first resistance threshold is known in the art.

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Needham, for example, teaches the short-circuit waveform control circuit controls the welding voltage to decrease when the resistance signal exceeds a first resistance threshold, controls the welding voltage to increase and the short-circuit period to decrease when the arc resistance signal is below the first resistance threshold (col. 3, lines 22-33). Needham further teaches such a configuration provides the wire feed speed can be reduced immediately on the onset of the short-circuit or after a delay period and likewise during the arcing period the feed speed can be increased (col. 3, lines 34-37).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kawamoto with calculating an arc resistance of Blankenship in order the arc length can be maintained during the welding process. Similarly, it would have been obvious to one of ordinary skill in the art to modify Kawamoto in view of Blankenship with the welding current to be held at a constant level when the resistance exceeds the resistance threshold, the constant level current being greater than a normal welding current generated based on the welding voltage of Churchward in order to overcome such increase in resistance and necessary to supply a greater voltage to the work to maintain a constant flow of current across the arc. Furthermore, it would have been obvious to one of ordinary skill in the art to modify Kawamoto in view of Blankenship and Churchward with the features above of Needham in order to provide the wire feed speed can be reduced immediately on the onset of the short-circuit or after a delay period and likewise during the arcing period the feed speed can be increased.

With respect to claims 2-4, Kawamoto discloses the claimed invention, including the consumable electrode type arc welding machine, wherein the short-circuit waveform control circuit accepts the welding current detection signal and outputs a short-circuit waveform control signal (Paragraph 3, lines 9-10), the switching circuit 25 (Fig. 4) selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period (Paragraph 3, lines 12-14), when the short-circuit arc judgment signal indicates the short-circuit period (Paragraph 2, line 3), the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal (Paragraph 3, lines 12-14), the welding power 5 (Fig. 1) is controlled based on the output from the switching circuit; wherein the arc waveform control circuit accepts the welding voltage detection signal and outputs an arc waveform control signal (Paragraph 3, lines 10-12).

With respect to claims 6-8, Kawamoto discloses the consumable electrode type arc welding machine, wherein the short-circuit waveform control circuit accepts the welding current detection signal and outputs a short-circuit waveform control signal (Paragraph 3, lines 9-10); the first switching circuit 11 (Fig. 1) selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period (Paragraph 3, lines 12-14); the switching circuit selects the short-circuit waveform control signal, and outputs a selected signal (Paragraph 3, lines 12-14), the welding power 5 (Fig. 1) is controlled based on the output from the switching circuit; wherein the arc waveform

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control circuit accepts the welding voltage detection signal and outputs an arc waveform control signal (Paragraph 3, lines 10-12).

Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Innami et al. (US 5834732) disclose the short-circuit controls the voltage (col. 2, lines 22-33; col. 3, lines 8-18; col. 10, lines 5-25).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KET D. DANG whose telephone number is (571)270-7827. The examiner can normally be reached on Monday - Friday, 7:30 - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoang Tu can be reached on (571) 272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KET D. DANG/
Examiner, Art Unit 3742
July 28, 2011

/Henry Yuen/
Supervisory Patent Examiner, Art
Unit 3742